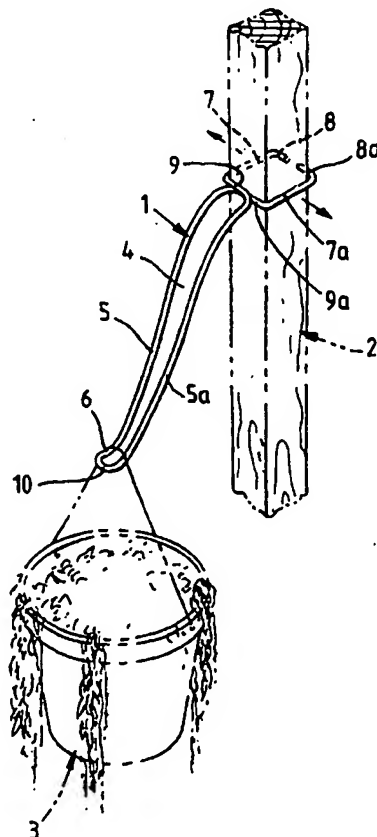


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/AU94/00721 <b>(22) International Filing Date:</b> 22 November 1994 (22.11.94) <b>(30) Priority Data:</b> PM 2544 22 November 1993 (22.11.93) AU PM 7109 28 July 1994 (28.07.94) AU <b>(71) Applicant (for all designated States except US):</b> HOWE-N-GENIUS PTY. LTD. [AU/AU]; 40 Harrison Street, Stretton, QLD 4116 (AU). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> HOWE, Wendell, Eric [AU/AU]; 40 Harrison Street, Stretton, QLD 4116 (AU). <b>(74) Agent:</b> CULLEN & CO.; Level 12, 240 Queen Street, Brisbane, QLD 4000 (AU).		<b>(81) Designated States:</b> AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ).  <b>Published</b> <i>With international search report.</i>

**(54) Title:** A BRACKET**(57) Abstract**

This invention provides a bracket (1) which can be used to support an article (3) from an upright (2) or horizontal member. The bracket (1) relies on an initial clamping force and then on the force of gravity to hold the bracket in position on an upright (2) or horizontal member and does not require fixing to the member with nails, screws or the like. The bracket can be used to support articles such as pot plants (3) or hanging baskets (23).



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A BRACKET  
TECHNICAL FIELD

This invention relates to a bracket for supporting an article from an upright or horizontal member and particularly relates to a bracket for supporting an article from an upright member of circular cross section.

BACKGROUND ART

Known brackets for supporting articles from upright or horizontal members such as verandah or pergola posts or fence cross-rails typically comprise an arm projecting from a backing plate. The backing plate is fixed to the upright or horizontal member with screws, nails or the like. Special equipment might be required for fixing the bracket to the upright or horizontal member and the fixing process has to be repeated if the bracket is repositioned. Fixing by nails or screws damages the upright or horizontal member which can be unsightly if the bracket is repositioned or removed.

DISCLOSURE OF THE INVENTION

It is an object of this invention to provide a bracket which can be easily fitted to an upright or horizontal member without damage to the member.

The present invention meets this objective by providing a bracket which relies initially on a spring-loaded or a lever clamping mechanism and then on the force of gravity to hold the bracket in position on an upright or horizontal member.

According to a broad format, this invention provides a bracket for supporting an article from an upright or horizontal member, the bracket comprising:

an arm having adjacent one end means to receive an article to be supported by the bracket and adjacent the other end a region which can act as a fulcrum; and

at least one gripping member shaped to partially fit about the upright or horizontal member.

In one embodiment, there is provided a bracket for supporting an article from an upright member, the

bracket comprising:

an arm having at least one elongate member, the arm having adjacent one end means to receive an article to be supported by the bracket and adjacent the other end  
5 a region which can act as a fulcrum; and

at least one gripping means having an elongate base member having side members at each end thereof;

wherein the region which can act as a fulcrum is interposed between the arm and the at least one  
10 gripping means and the at least one gripping means is linked to the arm via a said side member of the at least one gripping means.

The gripping means of this embodiment can be dimensioned so as to fit about an upright member of  
15 rectangular cross section such as a verandah post or a post supporting a pergola. The base member of the gripping means can run along the side of the upright member and at least the side member furthest from the fulcrum grips the adjacent side of the upright member  
20 when the bracket is in use. The length of the base member, and hence the distance between the side members, can be greater than the width of the upright member. For a typical verandah post of 80 mm square, the side members are at least 95 mm apart. The maximum distance between  
25 the side members is determined by the overall configuration of the bracket.

In use, the bracket is held to an upright member initially by a spring-loaded or a lever clamping mechanism and then by the force of gravity on the article  
30 supported by the bracket, causing the bracket to pivot about the fulcrum thereby forcing the side member of the gripping means furthest from the fulcrum to grip the upright member. After application of the initial force, the bracket in effect acts as a first order lever.

35 The region of the arm which acts as a fulcrum can be merely the end of the arm opposite the receiving means end. Alternatively, a side member of the at least one gripping means can act as the fulcrum in which case

the side member forms the fulcrum end of the arm.

The base member of the gripping means is typically linear and the side members lie in a plane which is essentially at 90° to the longitudinal axis of the base member. This allows the side member furthest from the fulcrum to effectively grip the upright member when the gripping means is positioned around the upright member. For maximum stability of the bracket when fitted to an upright member, the arm lies in a plane which is essentially parallel to or lies on the longitudinal axis of the upright member, which plane is essentially at 90° to the surface of the upright member against which the fulcrum rests.

Preferably, the bracket comprises two opposed gripping means pivotally linked to the arm. Biasing means can be provided to urge the gripping means towards each other. The biasing means is typically at least one coil spring between the two gripping means. In one form of the invention, two coil springs are provided, an end of each being joined to each base member and the other end of each being joined to the arm.

The gripping means side member furthest from the fulcrum is preferably of circular cross section to minimise or eliminate damage to the upright member when the side member grips the upright member. Sleeves of resilient or other material can be fitted around side members and/or the region of the arm which acts as a fulcrum to improve gripping of the upright member by the gripping means and to entirely eliminate the possibility of damage to the upright member.

Advantageously, the at least one elongate member making up the arm and the members of the gripping means are all of circular cross section.

Preferably, the bracket of this embodiment is fabricated from a single metal rod. The rod is bent at its mid-point to form a pivot for two gripping means and to provide means for receiving an article supported by the bracket. Portions of the rod extend from the pivot

in the same general direction to form an arm of two elongate members. At the end of the arm opposite the receiving means end, portions of the rod cross over to form side members of the opposed gripping means and a region of the arm which acts as a fulcrum. Portions of the rod then extend further to form the base members of the gripping means and finally the second side member of each gripping means.

In the foregoing embodiment, the resilience in the elongate members extending from the pivot provides the bias which urges the base members of the gripping means towards each other. To fit the bracket to an upright member, the two elongate members of the arm are urged together which causes the base members of the gripping means to move apart so that the gripping means can be positioned about the upright member. Advantageously, the axis of the pivot point is perpendicular to the plane of the two gripping means so that the base members of the gripping means remain parallel despite changes in the distance between the base members.

It will be appreciated that in brackets having two gripping means in accordance with this embodiment of the invention, the biasing means causes the base member of each gripping means to rest against a side of the upright member to which a bracket is installed. The base members thus rest against opposite sides of the upright member and at least the side members furthest the fulcrum are forced against a third side of the upright member by leverage applied through the bracket.

In another embodiment, the invention provides a bracket for supporting an article from an upright or horizontal member, the bracket comprising:

an arm having adjacent one end means to receive an article to be supported by the bracket and adjacent the other end a region which can act as a fulcrum; and  
at least one gripping member shaped to partially fit about the upright or horizontal member;

wherein the gripping member is pivotably connected to said arm at or near said fulcrum.

The operating principle of the bracket according to this embodiment of the invention is that the gripping member, essentially a hook, initially holds the bracket to an upright or horizontal member by a clamping force and then by the force of gravity on the article supported by the bracket causing the bracket to pivot about the fulcrum. After the initial application of the clamping force, the bracket in effect acts as a first order lever.

The pivoted mounting of the gripping member to the arm of the bracket is to allow the opening between the free end of the gripping member and the fulcrum to be increased to allow the bracket to be fitted to, or removed from, an upright or horizontal member. The bracket can be mounted to an upright or horizontal member of any cross-sectional shape commensurate with the dimensions of the gripping member. However, the gripping member is advantageously shaped in accordance with the cross-sectional shape of the upright or horizontal member to which the bracket is to be mounted.

For use with an upright member of circular cross-section, the gripping member typically has a J-shape with a flattened base. The flattened base provides a linear portion which can rest against the side of the upright member opposite the side against which the fulcrum rests.

In the case of an upright member of circular cross-section, the gripping member is preferably curved. The curvature of the gripping member in the region of contact with the upright member, that is, the region opposite the fulcrum, is typically similar to the curvature of the surface of the upright member.

Alternatively, the gripping member can have a shape corresponding to portion of a polygon, preferably, a hexagon, in the region of contact with the upright or horizontal member. A gripping member of this shape can

be used with an upright or horizontal member of any cross-sectional shape.

A gripping member can also be adapted to grip an upright or horizontal member of rectangular cross-section at a corner thereof or be adapted to grip an upright member of both circular or rectangular cross-section.

For use with horizontal members, the bracket preferably has two gripping members.

10 The region of the arm which acts as a fulcrum can be merely the end of the arm opposite the receiving means end. Preferably, however, a section is fixed transversely to the bracket arm to provide a broader contact area with the upright or horizontal member. The  
15 transversely fitted section can be curved if the bracket is to be mounted to a circular upright member. Transverse sections can also be adapted for contacting upright members of rectangular and/or circular cross-section, or contacting an upright member of rectangular  
20 cross-section at a corner thereof.

The gripping member can be pivotally connected directly to the arm or to a projection from the arm. Advantageously, the projection extends upwardly from the transversely fitted fulcrum section. The projection can  
25 be angled to increase the gap formed when the bracket is being removed from, or mounted on, the upright or horizontal member. The distance between the pivot point on the projection and the fulcrum can be engineered so that the bracket adopts a horizontal disposition when  
30 mounted on a vertical upright member.

The pivotal mounting of the gripping member to the arm or arm projection can be by any suitable means including a pin, rivet, stud, bolt, screw or the like.

The portion of the gripping member furthest  
35 from the fulcrum is preferably of circular cross section to minimise or eliminate damage to the upright or horizontal member when the gripping member grips the upright or horizontal member. Sleeves of resilient



material can be fitted around the appropriate portion of the gripping member and/or the region of the arm which acts as a fulcrum to improve gripping of the upright or horizontal member by the gripping member and to entirely  
5 eliminate the possibility of damage to the upright or horizontal member.

Advantageously, the arm and the gripping member are all of circular cross section.

Brackets according to the invention can be  
10 fabricated from any suitable material such as a metal or a plastic. Typically, the bracket is fabricated from a metal such as aluminium or steel.

The arm of brackets according to the invention can be linear or curved, or a combination of linear and  
15 curved portions. Typically, the arm is curved for aesthetic appeal.

The means to receive an article at an end of the arm include a hook or eyelet from which the article can be hung. Alternatively, a loop or the like can be  
20 formed in the arm to support the article. If brackets are fitted to one or more upright members adjacent a first upright member, a shelf or rail or the like between the adjacent upright members can be supported. Similarly, two or more brackets can be fitted along a horizontal  
25 member to support a shelf or rail. Typically, the means to receive an article is a hook from which a plant receptacle, basket or the like is hung.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a bracket  
30 according to one embodiment of the invention shown fitted to an upright member and supporting a plant receptacle.

Figure 2 is a perspective view of another bracket according to the same embodiment of the invention depicted in Figure 1 similarly shown fitted to an upright  
35 member and supporting a plant receptacle.

Figure 3 is a perspective view of a bracket according to another embodiment of the invention shown fitted to an upright member of rectangular cross-section

and supporting a plant receptacle.

Figure 4 is a perspective view of another bracket according to the embodiment of the invention depicted in Figure 3 similarly shown fitted to an upright member of circular cross section and supporting a hanging basket.

#### BEST MODE AND OTHER MODES FOR CARRYING OUT THE INVENTION

Referring first to Figure 1, there is shown bracket 1 fitted to upright member 2 shown in phantom and supporting plant receptacle 3. The bracket comprises an arm 4 consisting of elongate members 5 and 5a. The arm has a hook 6 at one end from which receptacle 3 is hung. Two gripping means consisting of base members 7 and 7a and side members 8, 8a, 9 and 9a are shown. Side members 9 and 9a also act as a fulcrum at the end of arm 4.

It can be seen from Figure 1 that elongate members 5 and 5a pivot about point 10 of arm 4. Urging elongate members 5 and 5a together causes base members 7 and 7a to move apart, as indicated by the arrows, so that the bracket can be repositioned.

Elongate members 5 and 5a can be urged together to an extent that side members 8 and 8a will clear the upright member and the bracket can be removed.

It can also be seen from Figure 1 that when bracket 1 is fitted to upright member 2, resilience in elongate members 5 and 5a urges base members 7 and 7a towards each other (opposite direction to the arrows) to clamp against the upright member. Downward pressure on arm 5 via force of gravity on receptacle 3 is transmitted through fulcrum 9, 9a to cause side members 8 and 8a to bind the bracket to the upright member.

Referring now to Figure 2, there is shown bracket 21 fitted to upright member 22 shown in phantom and supporting plant receptacle 23. The bracket 21 comprises arm 24 having a hook 25 at one end from which plant receptacle 23 is hung. The end region of arm 24 opposite hook 25 provides a fulcrum. Gripping means 27 and 27a are pivotally mounted to arm 24 via pivot pin 28

and side members 29 and 29a. Gripping means 27 and 27a are urged towards each other by spring 30. In an alternative form of this embodiment, two springs are provided - an end of one spring being linked to base member 34 and the other end to arm 24 while one end of the second spring is linked to base member 34a and the other end to arm 24. Protective sleeves 31, 32 and 32a are fitted to fulcrum 26 and side arms 33 and 33a respectively.

It can be seen from Figure 2 that downward pressure on arm 24 by gravity acting on plant receptacle 23 is transmitted through fulcrum 26 to cause side members 33 and 33a to bind to upright member 22. Spring 30 causes base members 34 and 34a to clamp against the upright member ensuring that side members 33 and 33a bind to the upright member. Removal or repositioning the bracket is effected by urging clamping means 34 and 34a apart as indicated by the arrows in Figure 2.

Referring now to Figure 3, there is shown bracket 41 fitted to upright member 42 shown in phantom and supporting plant receptacle 43. The bracket comprises an arm 44 having a hook 45 at one end from which receptacle 43 is hung. A fulcrum 46 is provided at the end of arm 44 by a section 47 transversely fitted to the arm. Gripping member 48 can be seen pivotably mounted to projection 49 from transverse section 47. It can be seen that upright member 42 in this instance has a rectangular cross-section and gripping member 48 is shaped accordingly.

It can also be seen from Figure 3 that downward pressure on arm 44 from plant receptacle 43 causes pivoting about fulcrum 46 which causes gripping member 48 to bind to upright member 42 in the region of the gripping member indicated at 50.

To remove the bracket from upright member 42, arm 44 is moved upwards so that the distance between fulcrum 46 and end 51 of gripping member 48 is increased. This allows the gripping member to be released from the

upright member. Mounting the bracket to an upright member is merely the reversal of the preceding procedure.

Referring now to Figure 4, there is shown bracket 61 mounted to upright member 62 of circular cross-section. Bracket 61 consists of arm 63 and transverse section 64 having a projection 65 to which gripping member 66 is pivotably mounted. A hook 67 in arm 63 can be used to suspend articles from the bracket. Transverse section 64 also acts as a fulcrum.

It will be appreciated from Figure 4 that the bracket grips the upright member, can be removed from the upright member, and can be mounted to the upright member, as described for the bracket depicted in Figure 3.

Within the limits of structural integrity of brackets according to the invention, the brackets can support articles of any weight as the heavier the article, the greater the binding of the bracket to the upright member via the fulcrum and gripping member.

It will be appreciated that many changes and modifications can be made to the invention as exemplified above without departing from the broad scope and ambit of the invention which is to be limited only by the appended claims.

## CLAIMS

1. A bracket for supporting an article from an upright or horizontal member, the bracket comprising:

an arm having adjacent one end means to receive  
5 an article to be supported by the bracket and adjacent the other end a region which can act as a fulcrum; and

at least one gripping member shaped to partially fit about the upright or horizontal member.

2. A bracket for supporting an article from an upright member, the bracket comprising:

10 an arm having at least one elongate member, the arm having adjacent one end means to receive an article to be supported by the bracket and adjacent the other end a region which can act as a fulcrum; and

15 at least one gripping means having an elongate base member having side members at each end thereof;

wherein the region which can act as a fulcrum is interposed between the arm and the at least one gripping means and the at least one gripping means is  
20 linked to the arm via a said side member of the at least one gripping means.

3. The bracket according to claim 2, wherein said elongate base member of said at least one gripping means is linear.

25 4. The bracket according to claim 2, wherein said at least one gripping means is pivotally linked to said arm.

5. The bracket according to claim 2, comprising two opposed gripping means pivotally linked to said arm.

30 6. The bracket according to claim 5, wherein said two gripping means are urged towards each other by biasing means.

7. The bracket according to claim 5, wherein said side members of said gripping means closest said arm  
35 comprise said fulcrum.

8. The bracket according to claim 5, which is formed from a single rod of material, the rod being bent at its mid-point to form a pivot for two gripping means

and to provide means for receiving an article supported by the bracket, portions of the rod extending from the pivot in the same general direction to form an arm of two elongate members; wherein at the end of the arm opposite the receiving means end, portions of the rod cross over to form side members of the opposed gripping means and a region of the arm which acts as a fulcrum, and wherein portions of the rod further extend to form the base members of the gripping means and the second side member of each gripping means.

9. A bracket for supporting an article from an upright or horizontal member, the bracket comprising:

an arm having adjacent one end means to receive an article to be supported by the bracket and adjacent the other end a region which can act as a fulcrum; and

at least one gripping member shaped to partially fit about the upright or horizontal member;

wherein the gripping member is pivotably connected to said arm at or near said fulcrum.

10. The bracket according to claim 9, wherein said at least one gripping member is pivotally connected to a projection from said arm.

11. The bracket according to claim 9, wherein said fulcrum comprises a member transversely fixed to said arm.

12. The bracket according to claim 11, wherein said at least one gripping member is pivotally connected to a projection extending from said member transversely fixed to said arm.

13. The bracket according to claim 9, wherein said at least one gripping member is adapted to grip an upright member of rectangular or circular cross-section.

14. The bracket according to claim 9, wherein said at least one gripping member is adapted to grip an upright member of both rectangular or circular cross-section.

15. The bracket according to claim 9, wherein said at least one gripping member is adapted to grip an

upright or horizontal member of rectangular cross-section at a corner thereof.

16. The bracket according to claim 11, wherein said transverse member is adapted to contact an upright  
5 member of rectangular or circular cross-section.

17. The bracket according to claim 11, wherein said transverse member is adapted to contact an upright member of both rectangular or circular cross-section.

18. The bracket according to claim 11, wherein said  
10 transverse member is adapted to contact an upright or horizontal member of rectangular cross-section at a corner thereof.

19. The bracket according to claim 9, comprising two gripping members.

15 20. The bracket according to claim 2 or claim 9, wherein said means to receive an article is selected from a hook, eyelet or loop, or a portion adapted to support a horizontally extending member.

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Fig.1.

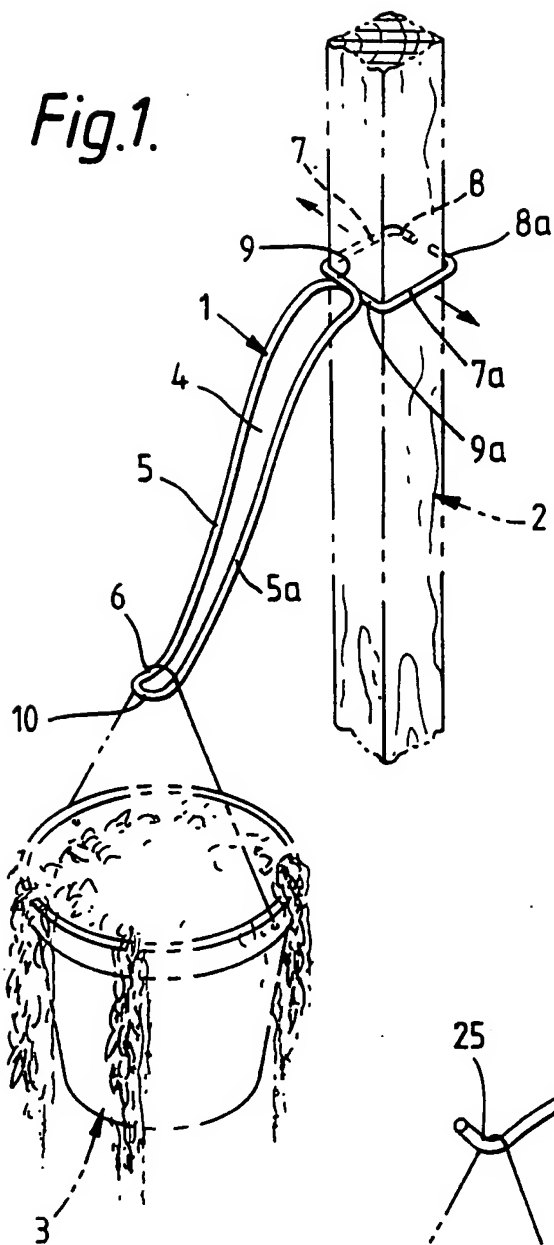
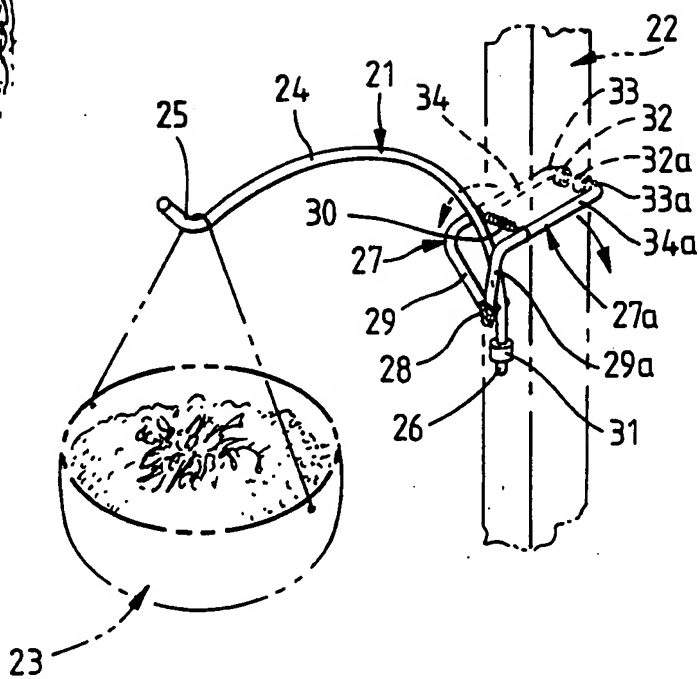


Fig.2.





2/2

Fig.3.

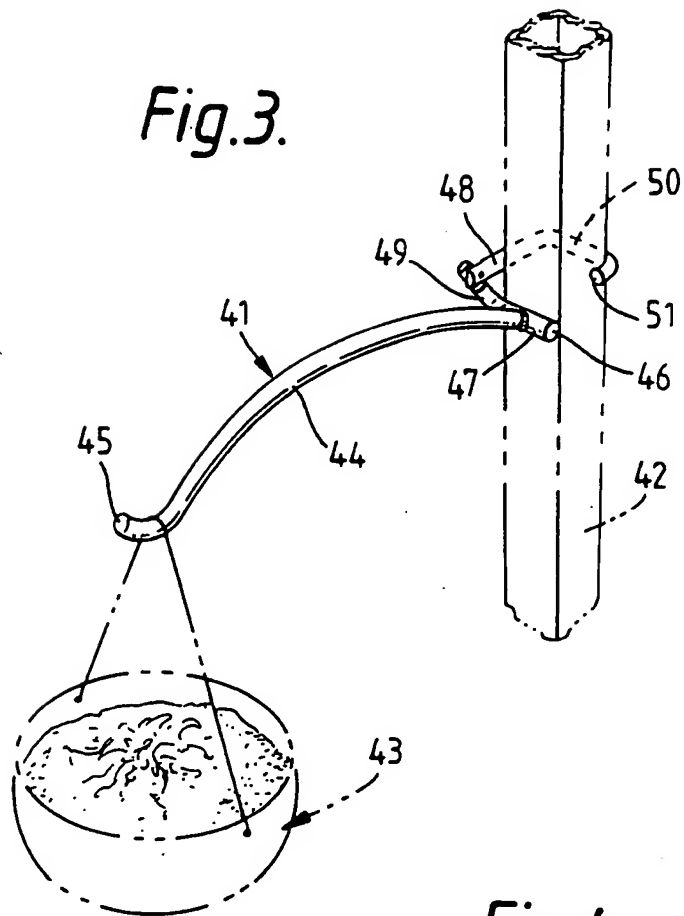
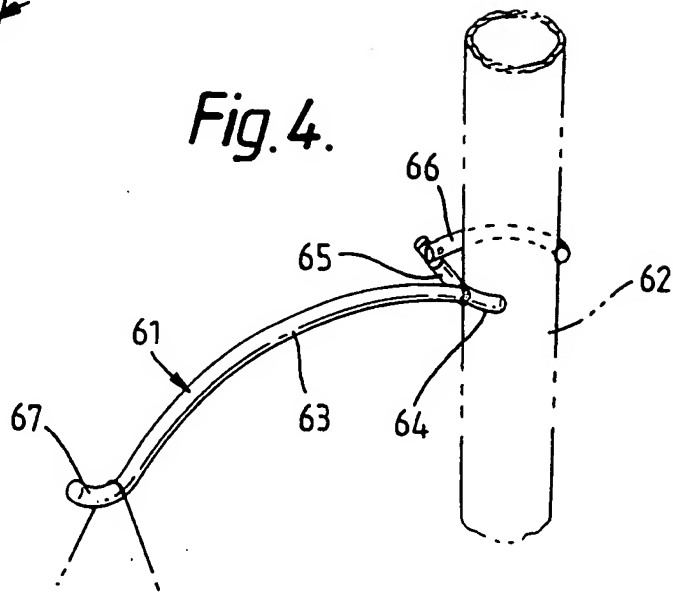



Fig.4.



<b>A. CLASSIFICATION OF SUBJECT MATTER</b> Int. Cl. <sup>6</sup> A01G 9/12; A47G 7/04; F16M 13/02  According to International Patent Classification (IPC) or to both national classification and IPC					
<b>B. FIELDS SEARCHED</b>  Minimum documentation searched (classification system followed by classification symbols) IPC: A01G 9/12, A47G 7/02, 7/04, F16M 13/02  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU: IPC as above; A01G 17/08, 17/10  Electronic data base consulted during the international search (name of data base, and where practicable, search terms used)					
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>					
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.			
X	AU,A, 28640/30 (GUY) 3 September 1931 (03.09.31) whole specification	1, 2, 20			
X	AU,B, 87442/75 (496370) (LANGENEGGER) 16 June 1977 (16.06.77) figure 4	1, 2, 20			
X	AU,A, 51767/79 (NOLDUS) 30 April 1981 (30.04.81) whole specification	1, 20			
X	GB,A, 2224439 (CARDWELL) 9 May 1990 (09.05.90) whole specification	1, 2, 20			
<div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.         </div> <div> <input checked="" type="checkbox"/> See patent family annex.         </div> </div>					
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; vertical-align: top;">           * Special categories of cited documents :             "A" document defining the general state of the art which is not considered to be of particular relevance            "E" earlier document but published on or after the international filing date            "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)            "O" document referring to an oral disclosure, use, exhibition or other means            "P" document published prior to the international filing date but later than the priority date claimed         </td> <td style="width: 10%; vertical-align: top; text-align: center;">           "T"  "X"  "Y"  "&amp;"         </td> <td style="width: 60%; vertical-align: top;">           later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle of theory underlying the invention            document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone            document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art            document member of the same patent family         </td> </tr> </table>			* Special categories of cited documents :  "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T"  "X"  "Y"  "&"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle of theory underlying the invention document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art document member of the same patent family
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Date of the actual completion of the international search 14 February 1995 (14.02.95)		Date of mailing of the international search report 17 Feb 1995 (17.02.95)			
Name and mailing address of the ISA/AU  AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION PO BOX 200 WODEN ACT 2606 AUSTRALIA  Facsimile No. 06 2853929		Authorized officer   G.M. COX  Telephone No. (06) 2832484			

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate of the relevant passages	Relevant to Claim No.
X	US,A, 4908982 (QUATRINI) 20 March 1990 (20.03.90) whole specification	1, 20
X	CH,A, 385442 (DEKUMBIS) 15 March 1965 (16.03.65) whole specification	1, 20
X	AU,A, 70838/91 (PECKHAM) 26 November 1981 (26.11.81) whole document	1, 2, 20

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
AU	87442/75				
AU	51767/79				
GB	2224439				
US	4908982				
AU	70838/91	EP	451498	JP	6047097
				US	5097832
					END OF ANNEX